

UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

PATENT NO. : 7,741,118 B1
APPLICATION NO. : 08/434105
DATED : June 22, 2010
INVENTOR(S) : David A. Fischhoff et al.

Page 1 of 3

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Delete the title page and substitute therefore the attached title page showing the corrected number of claims in patent

In the Claims:

At Column 108, line 46, add

-- 104. The method of claim 103, wherein the structural gene of step (c) is devoid or substantially devoid of polyadenylation signal sequences listed in Table II, or is devoid or substantially devoid of ATTTA sequences.

105. The method of claim 103, wherein the structural gene of step (c) is devoid or substantially devoid of polyadenylation signal sequences listed in Table II, and is devoid or substantially devoid of ATTTA sequences.

106. The method according to claim 103, wherein the structural gene made according to the method is more highly expressed in a dicot plant cell than a structural gene that comprises the starting coding sequence(s) of step (a).

107. The method according to claim 103, wherein the starting coding sequence of step (a) is derived from a *B.t.* crystal protein gene.

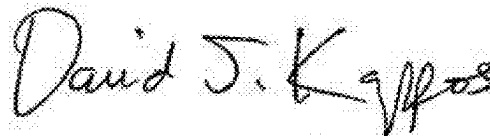
108. The method according to claim 103, further comprising reducing the number of regions in said portion with greater than five consecutive adenine and thymine (A+T) nucleotides by substituting sense codons for codons in the portion.

109. The method according to claim 103, further comprising attaching a plant promoter to the structural gene.

110. The method according to claim 103, further comprising including in the structural gene a sequence that encodes an amino-terminal chloroplast transit peptide.

This certificate supersedes the Certificate of Correction issued July 5, 2011.

Signed and Sealed this
Sixteenth Day of August, 2011

A handwritten signature in black ink that reads "David J. Kappos". The signature is written in a cursive, flowing style with a large initial "D".

David J. Kappos
Director of the United States Patent and Trademark Office

111. The method according to claim 103, further comprising attaching to the structural gene a 3' non-translated nucleotide sequence that comprises a plant polyadenylation signal.

112. The method according to claim 103, further comprising including in the structural gene a sequence that encodes a secretory signal sequence.

113. The method according to claim 103, further comprising making a DNA construct that comprises the structural gene and at least one sequence selected from the group consisting of a plant promoter or a plant virus promoter. --.

(12) **United States Patent**
Fischhoff et al.

(10) **Patent No.:** **US 7,741,118 B1**
(45) **Date of Patent:** **Jun. 22, 2010**

(54) **SYNTHETIC PLANT GENES AND METHOD FOR PREPARATION**

2001/0003849 A1 6/2001 Barton et al

FOREIGN PATENT DOCUMENTS

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(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

AU	B-36568/89	12/1989
AU	B-46881/89	6/1990
EP	0063949	11/1982
EP	0108580	5/1984
EP	0142924	5/1985
EP	0159884	10/1985
EP	0192319	8/1986
EP	0193259	9/1986
EP	0221024	5/1987
EP	0267159	5/1988
EP	0269601	6/1988
EP	0275957	7/1988
EP	0305275	3/1989
EP	0318143	5/1989
EP	0332104	9/1989
EP	0340948	11/1989
EP	0348348	12/1989
EP	0359472	3/1990
EP	0385962	9/1990
EP	0431829	6/1991
EP	0228838	4/1992
EP	0140556	7/1992
EP	0126546	3/1994
EP	0408403	8/1994
EP	0612848	8/1994
EP	0223452	4/1996
JP	62319288	7/1989
JP	61283228	10/1998
WO	WO-88/08880	11/1988
WO	WO-90/10076	9/1990
WO	WO-90/15139	12/1990
WO	WO-91/10725	7/1991
WO	WO-93/07278	4/1993

(21) Appl. No.: **08/434,105**

(22) Filed: **May 3, 1995**

Related U.S. Application Data

(60) Division of application No. 07/959,506, filed on Oct. 9, 1992, now Pat. No. 5,500,365, which is a continuation of application No. 07/476,661, filed on Feb. 12, 1990, now abandoned, which is a continuation-in-part of application No. 07/315,355, filed on Feb. 24, 1989, now abandoned.

(51) **Int. Cl.**
C12N 15/09 (2006.01)

(52) **U.S. Cl.** **435/440**

(58) **Field of Classification Search** None
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

4,356,270 A	10/1982	Itakura
4,448,885 A	5/1984	Schnepf et al.
4,771,131 A	9/1988	Herrnstadt et al.
4,859,596 A	8/1989	Hollenberg et al.
4,888,282 A *	12/1989	Beremand et al. 435/193
4,943,674 A	7/1990	Houck et al.
5,082,767 A	1/1992	Hatfield et al.
5,250,515 A	10/1993	Fuchs et al.
5,254,799 A	10/1993	De Greve et al.
5,270,200 A	12/1993	Sun et al.
5,380,831 A	1/1995	Adang et al.
5,495,071 A	2/1996	Fischhoff et al.
5,496,732 A	3/1996	Smigocki et al.
5,500,365 A	3/1996	Fischhoff et al.
5,567,600 A	10/1996	Adang et al.
5,567,862 A	10/1996	Adang et al.
5,625,136 A	4/1997	Koziel et al.
5,689,052 A	11/1997	Brown et al.
5,763,241 A	6/1998	Fischhoff et al.
5,866,784 A	2/1999	Van Mellaert et al.
5,880,275 A	3/1999	Fischhoff et al.
6,075,185 A	6/2000	Koziel et al.
6,180,774 B1	1/2001	Brown et al.
6,204,246 B1	3/2001	Bosch et al.
6,284,949 B1	9/2001	Fischhoff et al.
6,320,100 B1	11/2001	Koziel et al.
6,403,865 B1	6/2002	Koziel et al.
6,689,356 B1	2/2004	Zlotkin et al.
6,833,449 B1	12/2004	Barton et al.

OTHER PUBLICATIONS

U.S. Appl. No. 07/285,924, filed Dec. 19, 1988.
U.S. Appl. No. 07/286,002, filed Dec. 19, 1988.
U.S. Appl. No. 07/286,087, filed Dec. 19, 1988.
U.S. Appl. No. 07/320,195, filed Mar. 7, 1989.
Adami et al., "Adenovirus mRNA Processing—In a Regulated Manner a Splice Site Choice Dominates Over Selection of a Poly A Site Located in an Intron," *RNA Processing Meeting*, pp. 26, May 11-15, 1988.
Adang et al., "Characterized Full-Length and Truncated Plasmid Clones of the Crystal Protein of *Bacillus Thuringiensis* subsp. *Kurstaki* HD-73 and their Toxicity to *Manduca Sexta*," *Genes*, 36:289-300 (1985).

(Continued)

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(57) **ABSTRACT**

A method for modifying structural gene sequences to enhance the expression of the protein product is disclosed. Also disclosed are novel structural genes which encode insecticidal proteins of B.t.k. HD-1, B.t.k. HD-73, *B.t. tenebrionis*, *B.t. entomocidus*, 2 protein of B.t.k. HD-1, and the coat protein of potato leaf roll virus.

113 Claims, 46 Drawing Sheets